RP

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

August 27, 1985

RP:0052

Mr. James Ikeda, Acting Chief
Environmental Protection and Health Services Division
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Ikeda:

NPDES Permit
Kahe Generating Station
(Hawaiian Electric Company, Inc.)
Kahe, Oahu

In response to your request of July 23, 1985 we have reviewed the request by Dr. Brenner Munger of the Hawaiian Electric Company (HECO) to modify the marine monitoring program at Kahe Generating Station. Our review of this request has been prepared with the assistance of E. Alison Kay, Zoology and Frank Sansone, Oceanography.

Over the past 9 years, HECO has carried out an extensive monitoring program of the effects of their warm effluent water discharge on the marine biota off their Kahe Generating Station outfall. In general the monitoring program and quality of the data obtained have been exceptional and the work of Stephen Coles in particular has been most commendable. We are cognizant of the costs associated with any marine monitoring program and can understand HECO's desire to reduce these costs particularly if it can be shown that continuation of the program is not environmentally justified. Hence we have carefully reviewed the various requests for modification of the monitoring program and offer the following comments:

Temperature at the receiving water reference location

According to Dr. Munger's letter, the receiving water reference location for determining ambient temperatures is located 1 km north of Kahe and requires at least weekly visits by divers to calibrate the in-situ thermograph. HECO has requested permission to use the continuously recorded station intake temperatures for the baseline against which the allowed $+8.4^{o}$ C (15^{o} F) temperature rise is measured.

The continuation of the remote ambient station temperature measurement for the baseline value does not seem necessary. We note, however, that the intake temperatures are on the average from .5 to .6° C above the previously measured remote ambient values. This would have the effect of increasing the permitted discharge temperature by that amount which could cause significant impacts to the reef community. Therefore we recommend that if the intake temperatures are to be used for the baseline against which the permitted temperature discharge will be measured, that the baseline temperature be adjusted downward to take into account the average monthly differences recorded at the remote station.

Thermal plume

Assuming no change in discharge volume, rates, or temperatures the temperature limitation on reef areas appears to have been adequately documented. We see no reason to continue monitoring of the thermal plume.

Reef coral community

The conclusion, expressed in the documentation (July 9, 1985) supporting HECO's request, of a "substantially higher rate (of coral development) in the immediate vicinity of the outfall than elsewhere in the Kahe area" is somewhat misleading. The 1985 HECO annual report for the NPDES monitoring program at Kahe indicates (page 74) "an overall linear reduction in mean total coral coverage throughout the Kahe area since measurements were begun in 1973." Table 17, page 83, provides an annual summary of these changes and demonstrates the net loss in total coral coverage. A number of factors are presumed to have influenced this decline of which extreme storm wave conditions and sediment loads are suggested as the primary causes.

In contrast to the annual decreases in coral coverage recorded at the various reef stations in the general north-south coastal area of the Kahe outfall, measurements of coral recolonization along the outfall itself and on two reef stations in close proximity to the outfall have shown exponentially increasing recolonization trends (pages 112, 126 and Figure 22).

The apparent dichotomy between these two studies suggests that monitoring of the benthic populations should be continued. At the present time there has been no significant change in total coral coverage in the general coastal area since 1980. The slight increase recorded in 1984 while not statistically significant may represent the beginning of reef coral recovery. Since it is the first positive sign in 6 years it would seem most appropriate to continue monitoring of a few key indicator stations in this area. Stations to be monitored should include some at the outer limits of the existing study area to provide a baseline against which long term changes in coral coverage can be monitored.

The frequency of monitoring could be reduced to twice-a-year to reduce costs. Semi-annual monitoring of the benthic populations should provide sufficient timely data to identify changes attributable to catastrophic (storm) effects rather than HECO operations.

We hope you will find these comments useful in your discussions with Hawaiian Electric regarding their request. If you have any further questions, please do not hesitate to call.

Yours truly,

Jacquelin Miller
Acting Associate Specialist

cc: Steve Chang
Frank Sansone
Alison Kay
Patrick Takahashi, Act. Dir., Env. Ctr.